

## 2.4 Square Roots to Solve Problems

October 8, 2015 12:57 PM

ex Calculate the area of a square with side length 5.2cm.

$$A = l^2 = (5.2\text{cm})^2 \\ = 27.04\text{cm}^2$$

$$\begin{array}{r} 5.2 \\ \times 5.2 \\ \hline 104 \\ + 260 \\ \hline 27.04 \end{array}$$

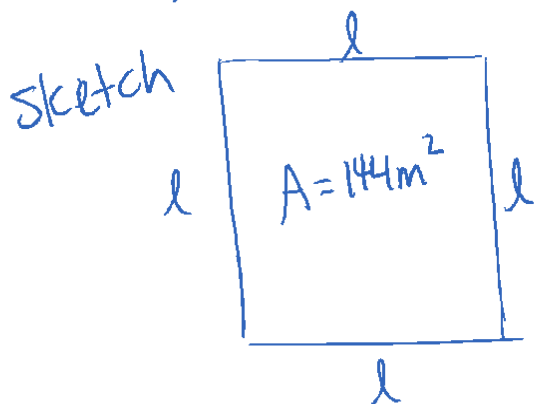
Answer to the nearest tenth. (1 decimal place)

$$A = 27.0\text{cm}^2$$

remember units

ex If the area of a square field is  $144\text{m}^2$

a) What is the length of each side?



$$A = l^2$$

$$l = \sqrt{A}$$

$$= \sqrt{144\text{m}^2}$$

$$l = 12\text{m}$$

b) What is the perimeter?

$$P = l + l + l + l = 4l$$

$$= 4(12\text{m})$$

$$= 48\text{m}$$

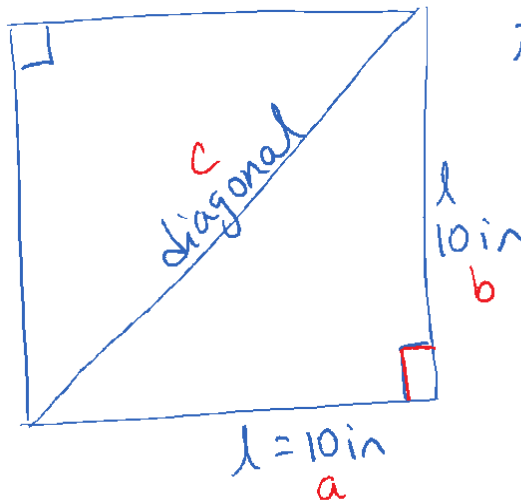
ex A floor  $5\text{m} \times 10\text{m}$  is covered by 25 square tiles. What are the dimensions of each tile?

$$A_{\text{floor}} = 5\text{m} \times 10\text{m} = 50\text{m}^2$$

$$A_{\text{tile}} = \frac{50\text{m}^2}{25 \text{ tiles}} = 2\text{m}^2/\text{tile}$$

$$A_{\text{tile}} = l^2 \rightarrow l = \sqrt{A_{\text{tile}}} \\ = \sqrt{2\text{m}^2} \\ = 1.4\text{m} \leftarrow \text{each side of tile}$$

ex The area of a <sup>square</sup> piece of paper is  $100\text{in}^2$ . What is the length of the diagonal?



$$A = 100\text{in}^2 = l^2 \\ l = \sqrt{100\text{in}^2} \\ = 10\text{in}$$

$$c^2 = a^2 + b^2 \text{ (Pythagorus)} \\ c^2 = (10\text{in})^2 + (10\text{in})^2 \\ \sqrt{c^2} = \sqrt{200\text{in}^2} \\ c = \sqrt{200\text{in}^2} \\ = 14.14\text{in}$$

Practice 78 # 5, 8, 15, 19, 21, 23, 25, 27

pythag